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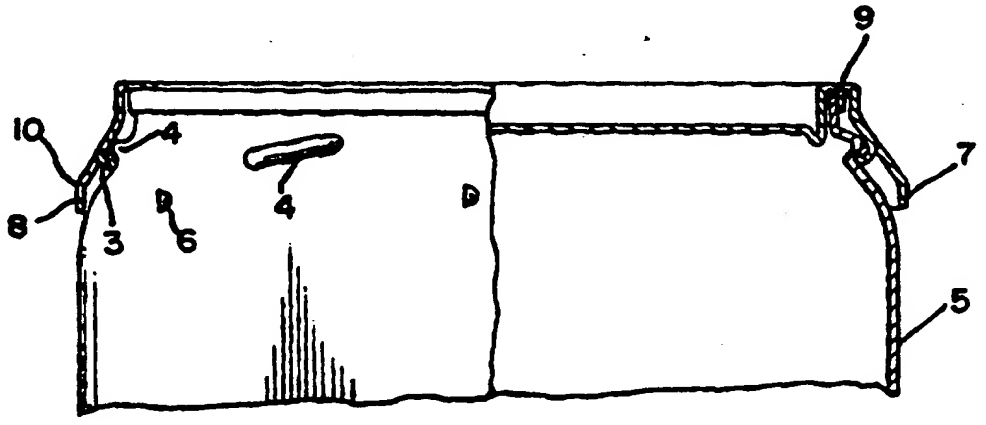
(54) Title: EASY-OPEN RESEALABLE CAN-END

(57) Abstract

A twist-on/twist-off resealable assembly for a can-end, such as a metal can (5) used in the beverage industry includes a first set of knuckles (4) formed on the can body near its top opening. A plurality of cooperating fingers (3) on the inside of the can lid (1) engage the knuckles so that the lid is tightened by its progressive downward motion as the lid is rotated. The lid also includes a weakened or frangible portion (2B) for forming a straw opening. A second set of knuckles (6) are located below the top set of knuckles for engagement by fingers (7) extending from a pilfer-proof ring. The twist-off can lid may be made from the same metal as the can body or alternatively from a transparent plastic material or a combination of metal and plastic.



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EASY-OPEN RESEALABLE CAN-END

BACKGROUND OF THE INVENTION

The present invention relates to a twist-on/twist-off, resealable assembly for a can end, such as a metal can used in the beverage industry. More specifically, the present invention relates to a resealable can end assembly which is easy to open and reseal by twisting of the closure on the can end.

Current can-ends for beverage cans are generally of the "ring-pull" or "press-down-stay-on-tab" type and have some disadvantages.

The are generally not resealable. The tabs are difficult to open and the opening size/shape are not ideal for drinking. Furthermore, the product is not visible through the can-end.

Most current can-ends for beverages are aluminum, and since these are joined to the can-body by roll-seaming, recycling is more difficult when using steel-body cans. A design of a can-end which is either less firmly attached to the body, or easily produced from either steel or aluminum, would be environmentally-friendlier by enabling single-material packages.

Finally, designs of can-ends which enable easy inclusion of a hidden-gift, or other promotional material, which is only accessibl when the can is

opened, would give significant promotional advantages in the market-place, compared with current can-ends.

SUMMARY OF THE INVENTION

Accordingly, it is the object of this invention to provide can-ends systems, which are recloseable, easy-open, easy-drink; which can offer product visibility; and which enable single-metal can-systems and hidden gift promotional possibilities.

The foregoing and other objects of this invention are fulfilled by providing a resealable can end assembly comprising:

a cylindrical can body having an open end and a closed end with a closure engaging finish extending around the exterior surface of the can body adjacent the open end;

a cylindrical closure having a depending peripheral skirt for operatively engaging said finish;

a first set of spaced knuckles on one of said finish or said skirt, said knuckles having angular surfaces on undersides thereof;

a plurality of spaced fingers on the other one of said finish or skirt for engaging the angular surfaces on the knuckles when the closure is tightly secured to the open end by relative rotation of said skirt and finish in a closing direction, said fingers releasing from the knuckles in response to relative rotation in an opening direction;

a second set of spaced knuckles disposed on the finish of the can; and

a pilfer-proof ring detachably secured to the bott m of said skirt having projecting fingers for engaging said second set of knuckles.

The can-lid with a twist-on closure feature, includes protrusion ("knuckles") formed on the can-body near its top opening, on which the fingers of the lid locate so that the lid is tightened by its progressive downward motion, when it is turned and the said fingers are forced to follow the downward angle on the bottom of the "knuckles". The lid has two sections separated by a deliberately-weakened portion, which is achieved by perforating the lid-material, or similar means. During can closing, the lower part of these said two sections is forced onto further "knuckles" which are formed near the top of the can-opening, and arranged so that this section can no longer be removed from the can-body, and so that the action of opening breaks the said weakened-portion, separating the said two sections and providing evidence of opening. The twist-off can-lid can be made from the same metal (or material), as the can body, or alternatively from a transparent plastic (enabling product visibility), or from a metal/plastic combination (enabling additional pressure-holding strength as well as product visibility)

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF DRAWINGS

The present invention will become more fully

understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus, are not limitative of the present invention and wherein:

FIGS. 1A to 1D show an embodiment of an all-metal, or all-plastic, twist-off can-lid, with an additional opening for a straw;

FIGS. 2A to 2E shows a further embodiment, which is a variation of that shown by Figure 1, and demonstrat s a combined metal and plastic twist-off can-lid, with the possibility of providing product visibility by using a suitable transparent plastic; and

Figure 3, shows options for promotional purposes in conjunction with the embodiments demonstrated in Figures 1 and 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1A shows the top view of a lid 1 with a ring-pull 2A connected to a frangible opening 2B for a straw. The user can either twist-off the lid 1 to open the top of the can 5 fully, or use the straw opening 2. Figure 1B shows the closing features of the lid 1, where fingers 3 locate on a multiplicity of "knuckles" 4 pressed into the can 5 sidewall in such a way as to give a progressive downward motion ("twist-on") to the lid 1 as it is rotated, compressing seal 9. A multiplicity of smaller locating "knuckles" 6 are also pressed into the can 5 sidewall below the "knuckles" 4 and these are gripped by pilfer-proof fingers 7. The locating "knuckles" 6 are shaped so that once the pilfer-proof fingers 7 pass over them to the closed position, these pilfer-proof fingers 7 cannot return and locate the pilfer-proof ring 8. The lid 1 has a top-surface which enables normal nesting of

can bases placed on top of it. Figure 1C shows the action of the "knuckles" 6 and the fingers 3, which provide the "twist-on" closing function, and of the pilfer-proof fingers 7 and locating "knuckles" 6, which locate the pilfer-proof ring 9. Figure 1D shows the side of the lid 1 and in particular the fingers 3, the pilfer-proof ring 8, its perforation 10 and the stay-on strap 11. The stay-on strap 11 holds the lid 1 to the pilfer-proof ring 8, and being in form of a hairpin, enables rotation of lid 1 relative to the pilfer-proof ring 8.

Figures 2A-E show a variation of the embodiment in Figure 1, wherein Figure 2A the principal difference is the replacement of lid 1, in Figure 1, by two parts. One part is a metal holding-ring 20, which incorporates the fingers 3, and the second part is a plastic cover 21, preferably of transparent material, which incorporates the pilfer-proof ring 8, the pilfer-proof fingers 7 and the stay-on strap 11. As shown in Figure 2B the holding-ring 20 connects with the "knuckles" 4 on the can 5, and the pilfer-proof fingers 7 connect with the locating knuckles 6 in the can 5, similarly as in Figure 1B. Figure 2C shows the action of knuckles 6 and fingers 3, which provide the same twist-on closing function as the embodiment in Figure 1. Figure 2C also shows the pilfer-proof fingers 7 and locating-knuckles 6, which locate the pilfer-proof ring 8. Figures 2D and 2E show further detail of the features of holding-ring 20 and the plastic cover 21 which essentially enable these two parts to fulfil together the same function as that described for the lid 1 in the embodiment shown in Figure 1.

By way of example, Figure 3 shows promotional possibilities in conjunction with the twist-on-off lid 1 version demonstrated by Figure 2. The metal holding ring

20 xtends to cover the plastic cover 21 thus p rmitting a hidden compartment 609, which is usable for gifts, prizes, etc. A side-space 61 can also be created for labels, information material, etc. The underside 62 of the metal holding ring 20 can also be used for printing messages, collect-me-pictures, etc.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from th spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A resealable can end assembly comprising:

a cylindrical can body having an open end and a closed end with a closure engaging finish extending around the exterior surface of the can body adjacent th open end;

a cylindrical closure having a depending peripheral skirt for operatively engaging said finish;

a first set of spaced knuckles on one of said finish or said skirt, said knuckles having angular surfaces on undersides thereof;

a plurality of spaced fingers on the other one of said finish or skirt for engaging the angular surfaces on the knuckles when the closure is tightly secured to the open end by relative rotation of said skirt and finish in a closing direction, said fingers releasing from the knuckles in response to relative rotation in an opening direction;

a second set of spaced knuckles disposed on the finish of the can; and

a pilfer-proof ring detachably secured to the bottom of said skirt having projecting fingers for engaging said second set of knuckles.

2. The assembly of claim 1 further including a strap connecting the skirt of the closure to the pilfer-proof ring.

3. The assembly of claim 1 wherein said closure further includes a frangible portion in a top surface thereof for

accommodating a drinking straw.

4. The assembly of claim 3 further including a pull-tab connected to said frangible portion.

5. The assembly of claim 1 wherein said closure is part metal and part transparent plastic, the part of the skirt engaging the finish being metal.

6. The assembly of claim 1 wherein the skirt comprises alternate sections of said metal and said transpar nt plastic.

7. The assembly of claim 6, wherein a top surface of the closure is metal.

8. The assembly of claim 7 further including a sealed compartment for housing a prize or the like below a top surface of the closure.

9. The assembly of claim 1 further including a sealed compartment for housing a prize or the like below a top surface of the closure.

10. The assembly of claim 1 further including a resilient sealing element between the closure and the open can end.

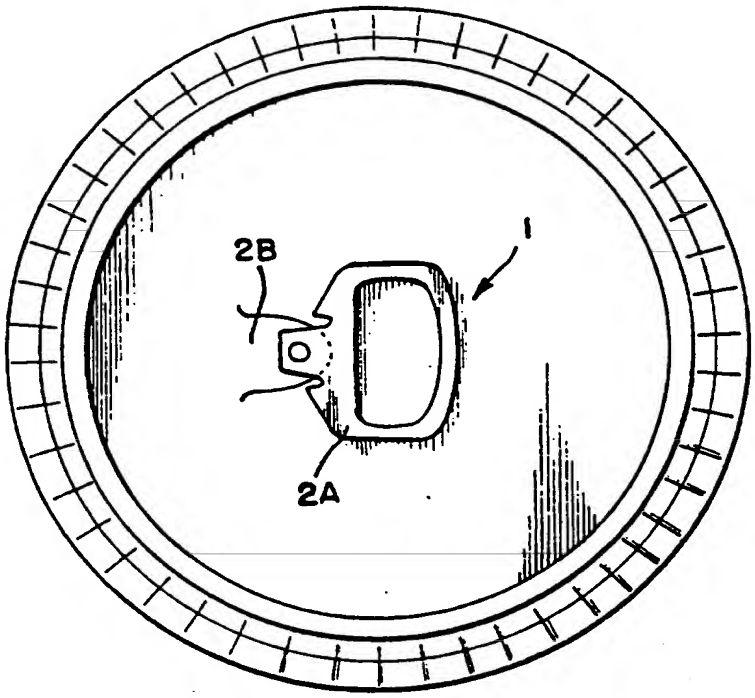

FIG.1A

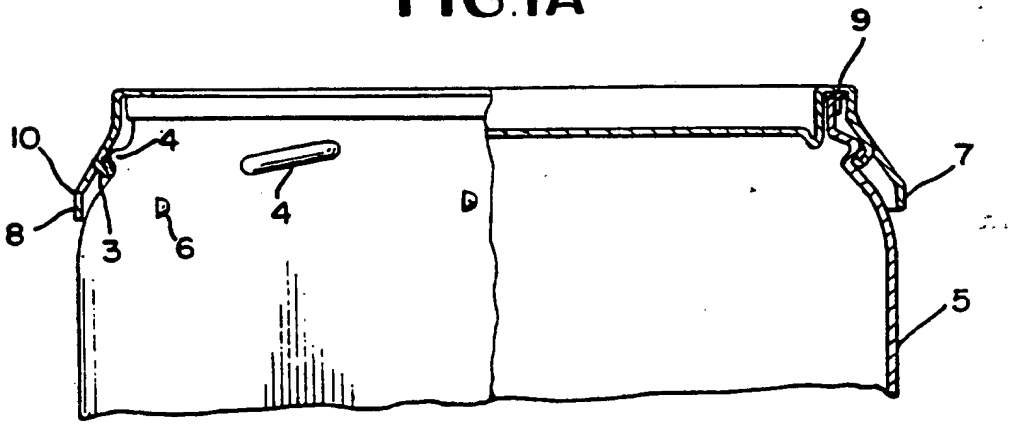

FIG.1B

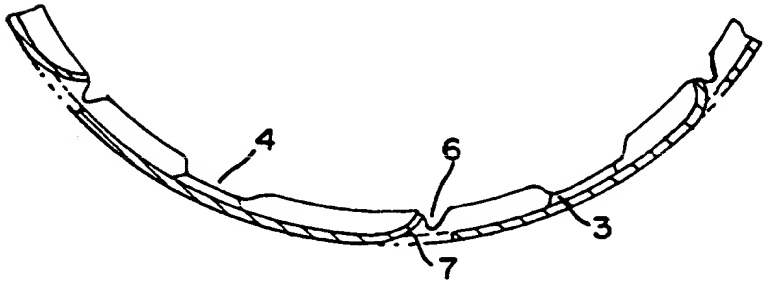

FIG.1C

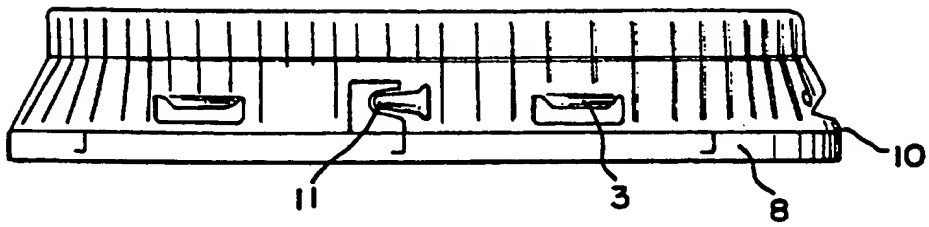

FIG. 1D

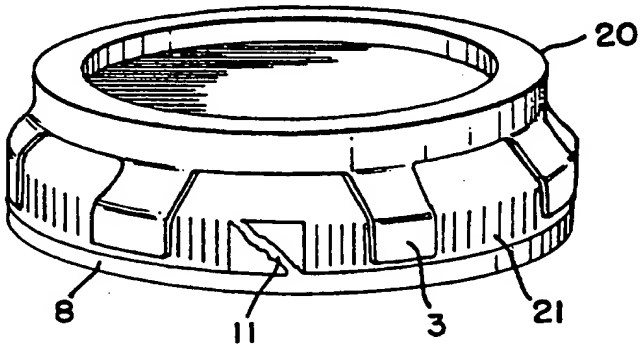

FIG. 2A

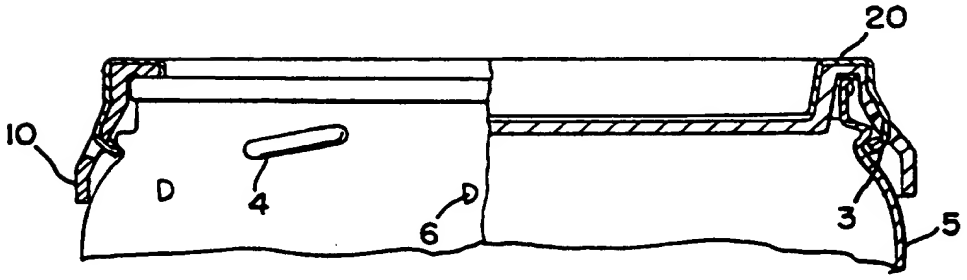

FIG. 2B

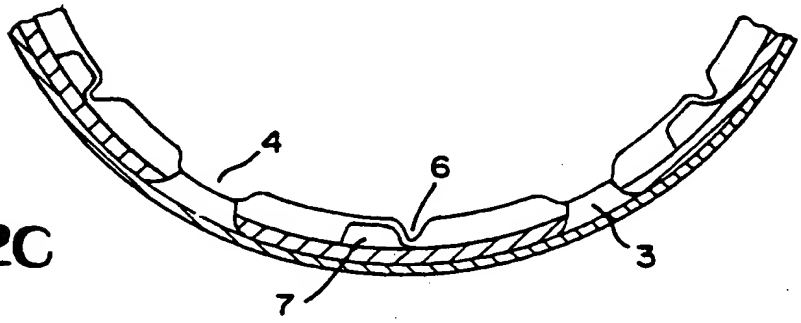

FIG. 2C

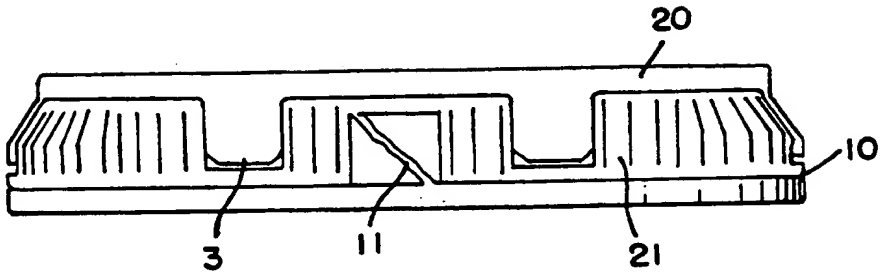

FIG. 2D

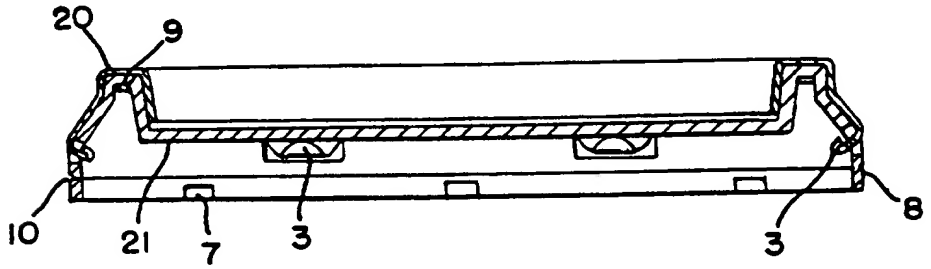

FIG. 2E

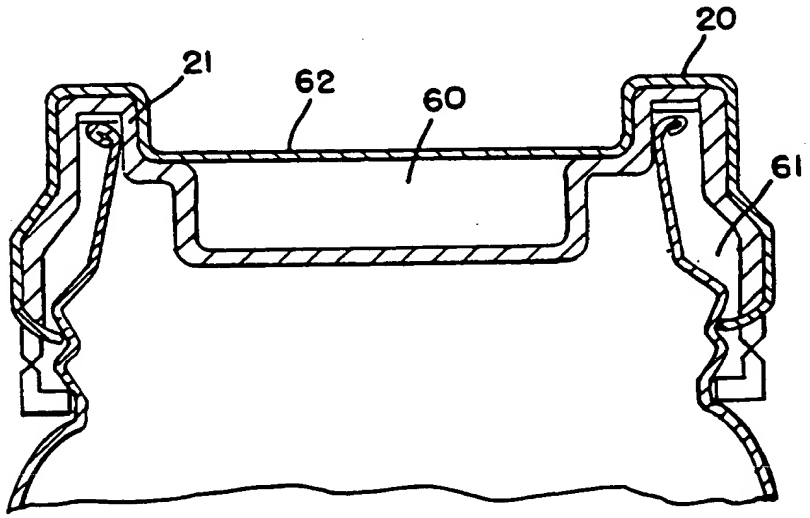

FIG. 3

INTERNATIONAL SEARCH REPORT

Interna. al Application No
PCT/US 95/12230

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65D43/08 B65D41/34 B65D51/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LU,A,77 084 (AIRFIX INDUSTRIES) 12 August 1977 see claims; figures	1,2
P,A	DE,U,94 18 851 (H & K MULLER) 9 February 1995 see claims; figures	1,2
A	US,A,5 255 812 (YU T. HSU) 26 October 1993 see abstract; figures	1,8,9
A	US,A,4 913 304 (COREY) 3 April 1990 see abstract; figures	1,3,4
A	DE,A,41 34 741 (REGNERI) 30 April 1992 see claims; figures	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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19 February 1996	04.03.96

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DE-A-4134741	30-04-92	DE-U- 9014858	10-01-91